

Midterm Exam

CMSY-199, Fall 2011

Section 1. Answer True or False to each of the following statements:

- _____ 1. If the number of loop iterations is known in advance, it is best to use counter-controlled repetition.
- _____ 2. The Java selection statements include `if`, `if..else`, and `switch`.
- _____ 3. The `break` and `continue` statements can be used to alter the flow of execution inside a repetition statement.
- _____ 4. The conditional OR operator (`||`) has higher precedence than the conditional AND operator (`&&`).
- _____ 5. A `static` method may not be called without creating an instance of a class.
- _____ 6. Methods which have different names but the same signature are said to be overloaded.
- _____ 7. The number of elements in an array can be returned with a call to its `length()` method while the number of elements in an `ArrayList` is stored in its `size` field.
- _____ 8. When an array is created with the `new` keyword, its elements are initialized automatically.
- _____ 9. The `ArrayList` class cannot automatically change size at runtime to accomodate additional elements.
- _____ 10. The `ArrayList` class is a member of the Java Collections Framework.

Section 2. Circle the letter of the best answer for each question:

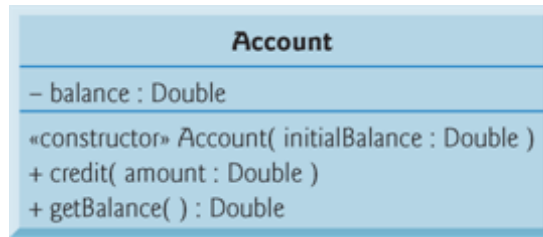
- 11. What symbol is used to indicate a variable-length argument list?
 - (a) underscore
 - (b) backslash
 - (c) ellipsis
 - (d) caret
- 12. Which of the following is *not* a valid Java identifier?
 - (a) `7wonders`
 - (b) `SEVEN_WONDERS`
 - (c) `sevenWonders`
 - (d) `SevenWonders`

13. Which of the following obeys the standard Java naming conventions for a constant?
- (a) `SomeConstant`
 - (b) `SOME_CONSTANT`
 - (c) `someConstant`
 - (d) `someconstant`
14. The command-line arguments for a Java application are stored in an array called `args`. What is stored in the element `args[0]`?
- (a) The first command-line argument
 - (b) The number of command-line arguments
 - (c) The name of the Java application
 - (d) The version number of the JVM
15. Which primitive type in Java is represented internally by a two byte unsigned integer value?
- (a) `boolean`
 - (b) `byte`
 - (c) `char`
 - (d) `short`
16. Which of the following Java keywords is used to identify constants?
- (a) `const`
 - (b) `final`
 - (c) `immutable`
 - (d) `parameter`
17. Which of the following primitive types cannot be promoted to a double in Java?
- (a) `boolean`
 - (b) `float`
 - (c) `integer`
 - (d) `long`
18. The maximum value that can be represented by the primitive `byte` type in Java is
- (a) 127
 - (b) 128
 - (c) 255
 - (d) 256

19. Which of the following is *not* an exception thrown by the JVM?

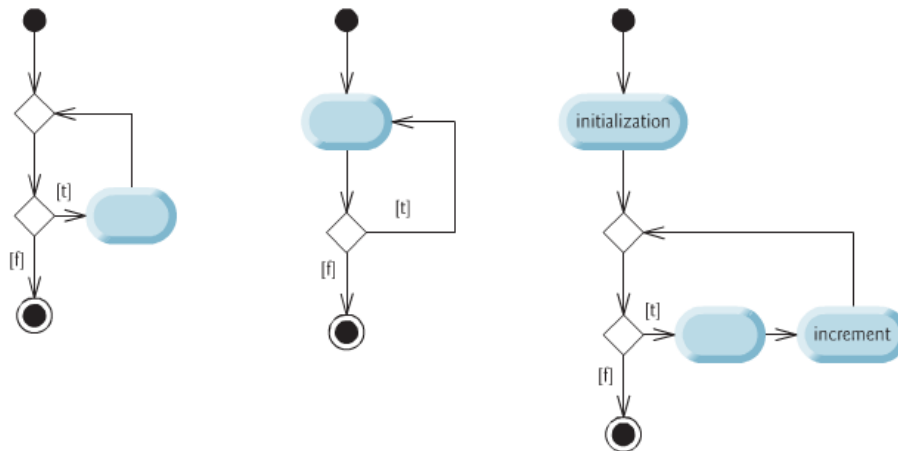
- (a) `MissingSemicolonException`
- (b) `NullPointerException`
- (c) `ArrayIndexOutOfBoundsException`
- (d) `ClassNotFoundException`

20. What Java access modifier should be used for the field **balance** in the UML diagram shown below?



- (a) `public`
- (b) `private`
- (c) `protected`
- (d) no modifier is needed - default or package access

21. Which Java control statement is represented in the second of the three UML activity diagrams shown below?



- (a) `if`
- (b) `switch`
- (c) `while`
- (d) `do...while`

Section 3. Answer the following questions:

22. Given the following three-argument constructor, write a Java statement to create an instance of the `Employee` class called `oracleChief` for an employee whose name is Larry Ellison and has an annual salary of 84.5 million dollars.

```
public Employee(String first, String last, double pay)
{
    firstName = first;
    lastName = last;
    salary = pay;
}
```

23. The `determineLargest` method takes a ten-element integer array and returns the largest integer in that array. Write the Java code to implement this method.

```
public int determineLargest(int number[])
{

}

}
```

24. Using the static `min` method from the `Math` class, write a single Java statement which assigns the smallest of three integer variables - `a`, `b`, and `c` - to an integer variable named `minimum`.

25. What output is produced by the following Java code segment?

```
for (int i=1; i <= 4; i++)
{
    for (int j=1; j <= i; j++)
        System.out.print("*");
    System.out.println();
}
```

26. Complete the `TrafficLight` class by writing a `switch` statement that prints the appropriate action to take based on the color of the traffic light.

```
public class TrafficLight
{
    private enum Color {RED, YELLOW, GREEN};

    public void printAction(Color lightColor)
    {
        switch(
            )
        {

        }

    }

}
```

Section 4. Circle the letter of the best answer for each question:

27. What is the output when the following Java application is run?

```
public class Dog
{
    private String name;

    public static void main(String args[])
    {
        Dog myDog = new Dog();
        myDog.name = "Achilles";
        int age = 5;

        changeDog(myDog, age);
        System.out.println(myDog.name + " " + age);
    }

    private static void changeDog(Dog dog, int age)
    {
        dog.name = "Chloe";
        age = 4;
    }
}
```

- (a) Achilles 4
- (b) Achilles 5
- (c) Chloe 4
- (d) Chloe 5

28. What is the output if you compile and execute the following Java application?

```
public class Hello
{
    public static void main(String args[])
    {
        System.out.println("Hello")
    }
}
```

- (a) "Hello"
- (b) Hello
- (c) Compilation fails.
- (d) An exception is thrown at runtime.

29. Consider the following code segment.

```
public class Break
{
    public static void main(String args[])
    {
        int k = 4;
        while (true)
        {
            k--;
            int j = 6;
            k = 13 - j;
            if (j-- == 3)
                continue;
            else
                break;
        }
        System.out.println(--k);
    }
}
```

What is printed as a result of executing the code segment?

- (a) 2
- (b) 3
- (c) 6
- (d) 7

30. What is the output if you compile and run the following Java application with the command `java Vark we rule`?

```
public class Vark
{
    public static void main(String args[])
    {
        Vark v = new Vark();
        v.go(args,42);
    }

    private void go(String a[], int life)
    {
        System.out.println(a[2]);
    }
}
```

- (a) we
- (b) rule
- (c) Compilation fails.
- (d) An exception is thrown at runtime.

31. What is the output if you compile and run the following Java application?

```
public class ForLoop
{
    public static void main(String args[])
    {
        int x = 2;
        int y;
        for (y=2; y > 0; y--)
        {
            System.out.print(x + " " + y + " ");
            x++;
        }
        System.out.print(x + " " + y + " ");
    }
}
```

- (a) 2 1 3 0
- (b) 2 2 3 1 4 0
- (c) Compilation fails.
- (d) An exception is thrown at runtime.

32. Consider the following code segment.

```
for (int k = 0; k < 20; k = k + 2)
{
    if (k % 3 == 1)
        System.out.print(k + " ");
}
```

What is printed as a result of executing the code segment?

- (a) 4 16
- (b) 4 10 16
- (c) 0 6 12 18
- (d) 1 4 7 10 13 16 19
- (e) 0 2 4 6 8 10 12 14 16 18

33. Consider the following code segment.

```
ArrayList<String> list = new ArrayList<String>();  
  
list.add("P");  
list.add("Q");  
list.add("R");  
list.set(2, "s");  
list.add(2, "T");  
list.add("u");  
System.out.println(list);
```

What is printed as a result of executing the code segment?

- (a) [P, Q, R, s, T]
- (b) [P, Q, s, T, u]
- (c) [P, Q, T, s, u]
- (d) [P, T, Q, s, u]
- (e) [P, T, s, R, u]

Section 5. Fill in the blanks in each of the following statements:

- 34. There are two aspects to learning Java - the _____ itself and the classes in the _____.
- 35. In order to read keyboard input from the user in a Java program, you should import the _____ class from the _____ package.
- 36. An error which violates the rules of the Java language and prevents compilation is called a _____ error while an error that produces an incorrect result during runtime is a _____ error.
- 37. In order to create an instance of a class, you must use the _____ keyword and make a call to the _____.
- 38. Java has two fundamental data types - the _____ type and the _____ type.
- 39. The members of a class consist of its _____ and _____.
- 40. When writing a GUI application, you often need to import classes from the java._____ and the javax._____ packages.